THE CLIMATE OF NORTHERN IRELAND

Climatological Memorandum 143

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The front cover shows a view of Northern Ireland from the satellite Tiros N taken at 0844 GMT on Friday 20 April 1981 – photograph by courtesy of the Department of Electrical Engineering and Electronics, University of Dundee.

An anticyclone centred to the north-west of Ireland gave a dry day with long sunny periods, some 8 to 12 hours, and afternoon temperatures up to 15°C. The patches of cloud are at medium or high altitudes.

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Meteorological Office, Belfast
March 1983

INTRODUCTION

This brief description of the climate of Northern Ireland has been compiled for the general reader and with the requirements of the tourist in mind. Further detailed information about the climate or analyses of data for specific purposes such as design or planning requirements may be obtained from:

The Principal Meteorological Officer
Meteorological Office
Progressive House
1 College Square East
Belfast BT1 6BQ

A fee may be charged, depending on the amount of staff effort needed to supply the information.

Weather information and forecasts can be obtained from:

Meteorological Office
Belfast (Aldergrove) Airport
Telephone: Crumlin 52339

The Automatic Telephone Weather Service gives up-to-date weather forecasts for Northern Ireland for up to three days ahead.

Telephone: Belfast 8091

Requests for climatological information for other parts of the United Kingdom should be addressed to:

FOR ENGLAND AND WALES

The Director-General
Meteorological Office (Met O 3b)
London Road
Bracknell
Berkshire RG12 2SZ
Telephone: Bracknell (0344) 20242

FOR SCOTLAND

The Superintendent
Meteorological Office
231 Corstorphine Road
Edinburgh EH12 7BB
Telephone: 031-334 9721

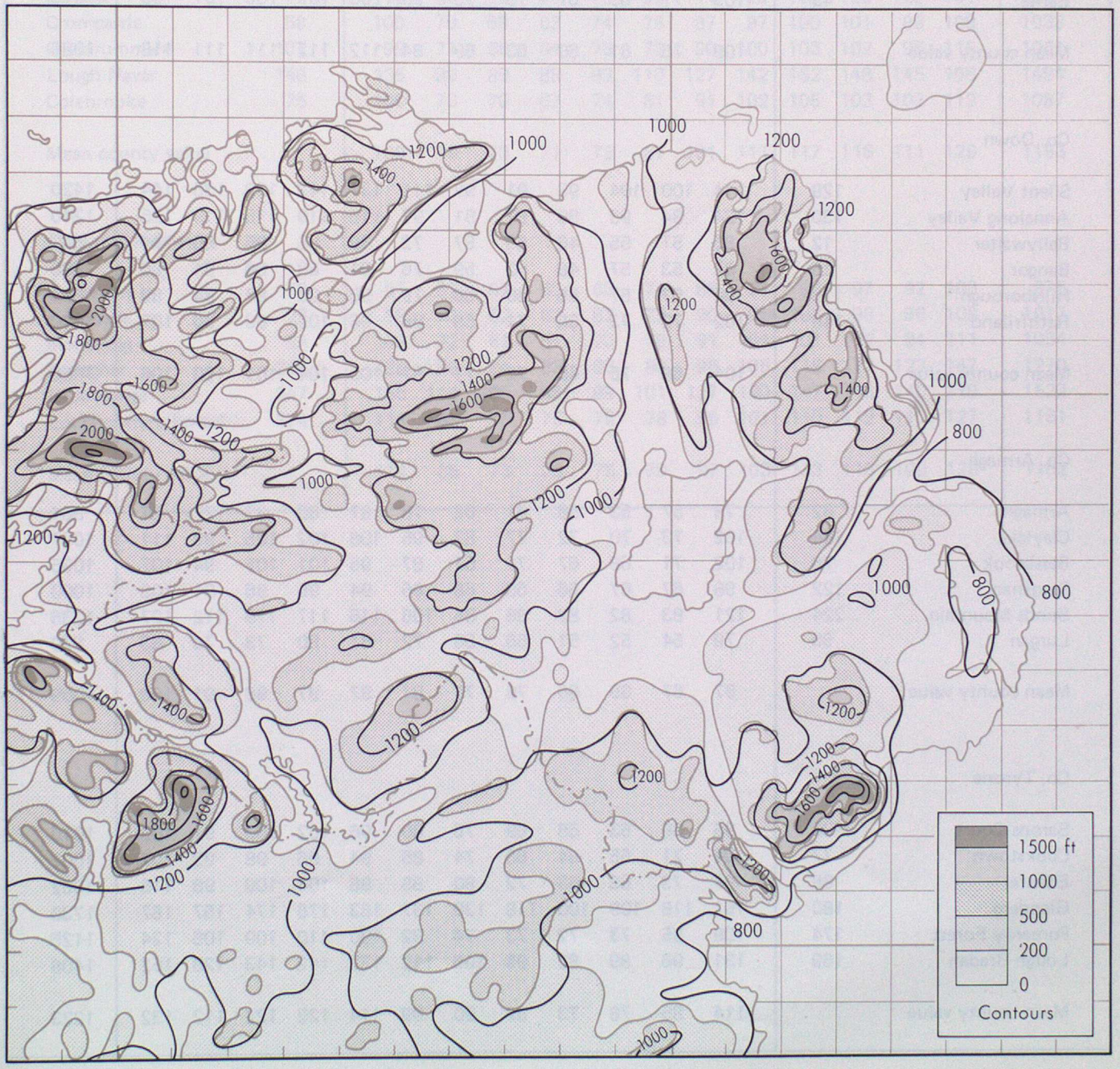
Giant's Causeway.

RAINFALL

The area of Northern Ireland consisting of six counties, namely Antrim, Armagh, Londonderry, Down, Fermanagh and Tyrone, is 14 153 square kilometres or 5462 square miles. Within this region there is a wide variety of topographical features and coastal types. Around the inland basin centred on Lough Neagh (the largest lake in the British Isles) are encircling belts of uplands. The Antrim Plateau slopes upwards to front the North Channel with impressive cliffs.

In the north-west the Sperrin Mountains have several peaks above 600 metres and to the south the Mourne Mountains, together with Slieve Croob and Slieve Gullion, are predominant. Together with the intervening valleys and estuaries these upland areas exert a strong influence on the distribution of rainfall (Figure 1). Amounts range from 1700–1800 millimetres a year to less than 800 millimetres in the vicinity of Strangford Lough in the extreme east of the Province.

FIGURE 1 Northern Ireland annual rainfall



In addition to topographical effects, greater exposure to the prevailing south-westerly rain-bearing winds results in generally higher amounts of rainfall in the more western parts of Northern Ireland (Table 1). Thus counties Londonderry, Fermanagh and Tyrone are wettest and, for example, Aldergrove, County Antrim (altitude 68 m) has 912 millimetres annual rainfall whereas considerably more (1149 millimetres) falls at Castle Archdale (altitude 66 m) in County Fermanagh.

TABLE 1 Monthly and annual averages (1941–70) of rainfall in millimetres for a selection of stations in each county of Northern Ireland

Location	Altitude (metres)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Co. Antrim														
Aldergrove	68	87	60	58	57	62	66	81	90	89	86	84	92	912
Ballymena	38	95	65	58	59	63	73	88	97	97	99	94	105	993
Ballypatrick	152	120	86	78	80	79	91	110	127	126	124	129	132	1282
Belfast PS	5	95	64	63	58	62	62	74	87	92	88	94	99	938
Parkmore Forest	235	155	111	100	102	102	118	143	163	163	161	166	171	1655
Larne	43	103	71	69	67	73	75	93	106	107	106	101	108	1079
Mean county value		109	76	61	60	63	69	84	112	112	111	111	118	1086
Co. Down														
Silent Valley	129	144	100	104	93	91	92	111	131	143	132	135	144	1420
Annalong Valley	130	124	84	93	80	87	81	97	116	119	115	119	125	1240
Ballywalter	12	85	51	55	46	59	57	73	89	85	85	80	84	849
Bangor	15	87	53	57	48	62	59	76	91	88	89	84	86	880
Hillsborough	116	84	57	57	55	60	66	79	96	90	87	84	89	904
Rathfriland	149	102	72	73	68	71	68	86	96	102	99	96	107	1040
Mean county value		104	69	75	65	72	71	87	103	104	101	100	106	1056
Co. Armagh														
Armagh	62	78	57	53	58	61	68	75	87	80	83	77	87	864
Claylake	184	102	73	70	72	77	83	95	108	102	105	99	111	1097
Bessbrook	76	102	71	68	67	71	67	87	95	101	105	94	107	1035
Seagahan	122	98	67	67	66	69	68	86	94	95	96	91	103	1000
Bonds Mountain	224	121	83	82	82	86	85	106	116	117	119	112	127	1236
Lurgan	55	79	54	52	51	56	58	72	81	80	78	76	83	820
Mean county value		97	67	65	66	70	71	87	97	97	98	91	103	1009
Co. Tyrone														
Barons Court	90	95	69	63	58	69	76	80	96	102	102	91	109	1010
Cookstown	77	94	71	65	64	66	74	85	94	96	98	93	107	1007
Edenfel	88	97	73	68	63	72	80	85	98	104	109	98	115	1062
Glenderg	180	161	118	109	100	118	130	137	163	176	174	157	187	1730
Pomeroy Forest	174	109	85	73	72	73	74	92	100	110	109	105	124	1126
Lough Bradan	169	131	96	89	82	95	106	112	132	142	143	128	152	1408
Mean county value		114	85	78	73	82	90	99	114	122	122	112	132	1223

Northern Ireland is, however, screened from winds from the south-west to some extent by the Donegal Highlands to the west and other upland areas of the Republic of Ireland to the south. As a result, even the wettest parts of the Province are drier than the hilly areas of the Republic of Ireland where annual amounts reach more than 3000 millimetres (Figure 2).

Similarly the exposed upland areas of Scotland, England and Wales are considerably wetter than any part of Northern Ireland. On the other hand the protected areas of eastern England, with annual rainfall in the range of 500–600 millimetres, are much drier than the driest zones of Northern Ireland. In general terms, therefore, the rainfall of Northern Ireland is about 'average' for the British Isles, being less than that for Scotland and Wales, but slightly more than that for England.

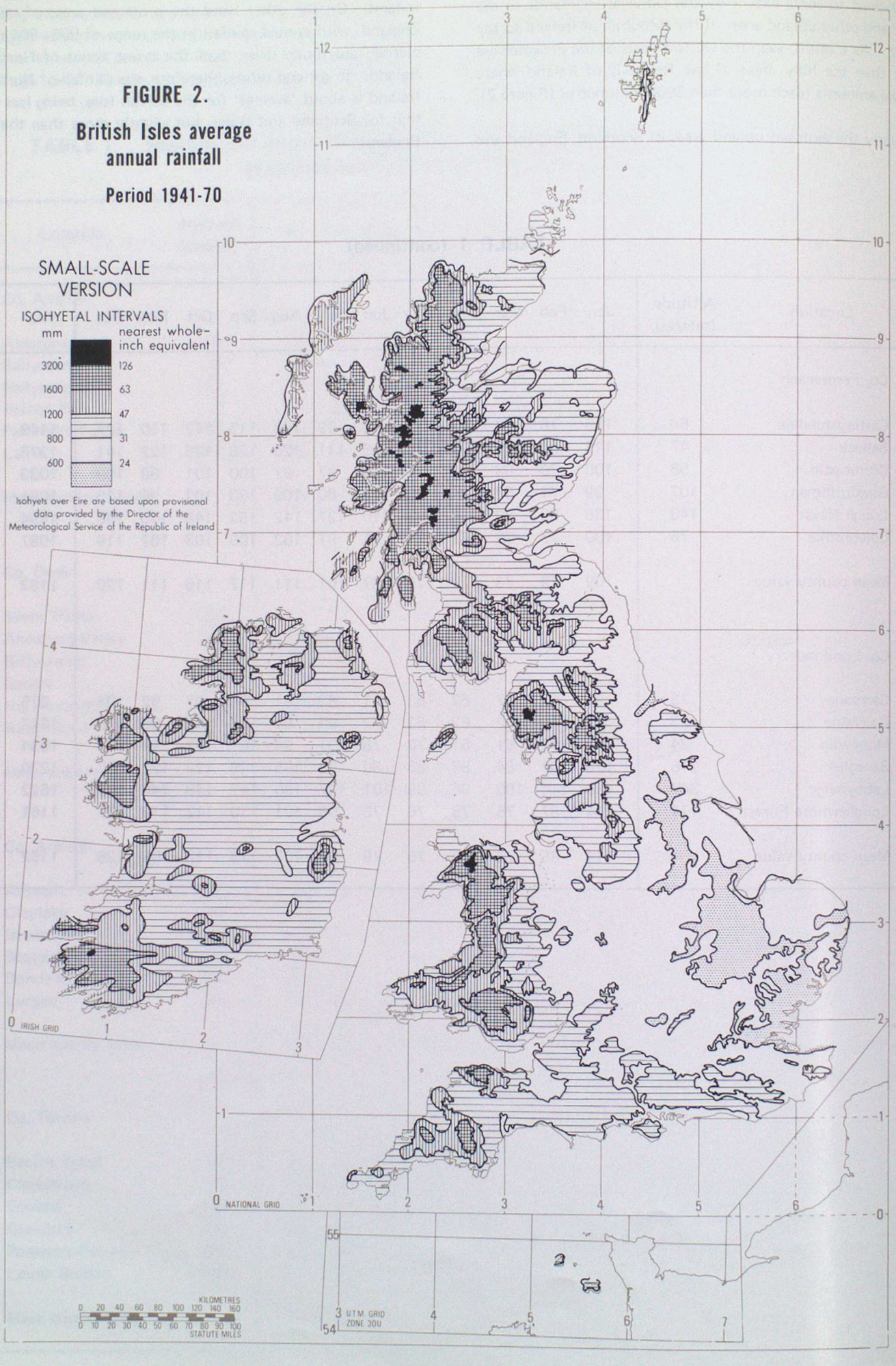
TABLE 1 (continued)

Location	Altitude (metres)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Co. Fermanagh														
Castle Archdale	66	103	76	70	67	77	85	99	108	115	112	110	127	1149
Belleek	47	115	86	75	74	78	95	111	120	128	128	122	141	1273
Cromcastle	58	100	70	68	63	74	75	87	97	100	101	89	109	1033
Glasdrumman	107	99	71	68	64	75	78	90	100	103	102	96	115	1061
Lough Navar	148	135	99	89	88	93	110	127	142	152	148	145	166	1494
Colebrooke	76	100	73	70	67	74	81	91	102	105	103	102	119	1087
Mean county value		109	79	73	71	79	87	101	111	117	116	111	129	1183
Co. Londonderry														
Carmoney	73	91	67	57	62	63	71	83	91	98	97	92	103	975
Coleraine	23	99	70	62	62	62	72	90	95	103	98	96	108	1017
Moneydig	34	102	72	61	61	70	75	91	94	101	102	94	111	1034
Banagher	216	128	99	84	83	83	80	98	105	118	122	123	147	1270
Labbyheige	347	150	114	100	96	99	101	127	130	147	148	140	170	1522
Loughermore Forest	174	114	87	75	75	76	78	96	101	110	112	110	127	1161
Mean county value		114	85	73	73	75	79	97	103	113	113	109	128	1162

FIGURE 2.

British Isles average annual rainfall

Period 1941-70


SMALL-SCALE VERSION
ISOHYETAL INTERVALS
mm
nearest whole-inch equivalent
3200 126
1600 63
1200 47
800 31
600 24
Isohyets over Eire are based upon provisional data provided by the Director of the Meteorological Service of the Republic of Ireland
IRISH GRID
NATIONAL GRID
UTM GRID ZONE 30U
KILOMETRES
0 20 40 60 80 100 120 140 160
0 10 20 30 40 50 60 70 80 90 100
STATUTE MILES

TEMPERATURE AND HUMIDITY

Temperature and humidity, together with wind speed, determine how warm or cold the weather feels to the individual. Owing to the influence of the surrounding sea (which remains relatively warm in winter) Northern Ireland experiences few very cold days in winter. Conversely, in summer, since no part of the Province is very far from the sea, cooler sea-breezes tend to limit the daytime maximum temperatures. The overall change, therefore, in temperature levels from winter to summer is much less than that which occurs in central Europe (where oceanic influences are small) and is also somewhat smaller than the typical variation experienced in central southern England or the Highlands of Scotland.

The variation in January mean maximum temperatures across Northern Ireland is given in Figure 3. Those areas most protected from the influence of the surrounding sea are a degree or so colder than the coastal fringe. In summer (Figure 4), since the most important factor is heating of the ground by the sun, inland regions become warmer than those near the coast. However, the overall range is not large, being about 1 °C.

Overnight cooling plays a major role in determining minimum temperatures so that, in January, the mean minimum temperatures in the south-west and north-east approach freezing point (Figure 5). These two zones of lowest temperatures are separated by the Lough Neagh basin, which suggests that the relatively high water temperatures in January (about 4 °C) determine minimum temperatures in the vicinity. The coastal fringe of County Down has the highest minimum temperatures, which exceed 2.5 °C in places. July minimum temperatures are rather less variable (Figure 6) but, overall, the central areas are cooler at night than the coastal areas.

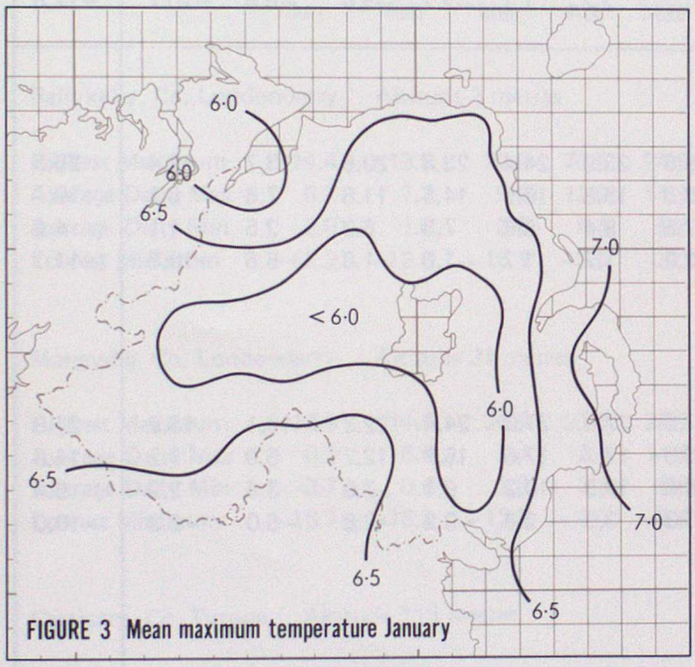


FIGURE 3 Mean maximum temperature January

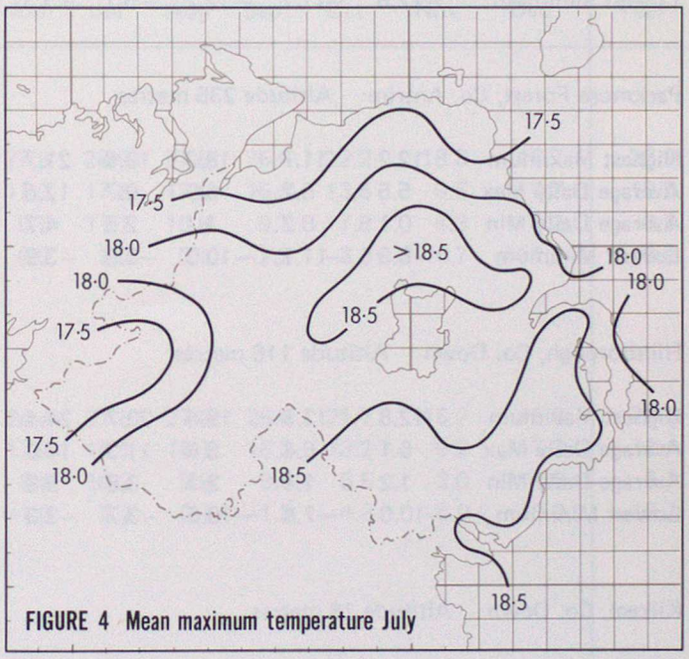


FIGURE 4 Mean maximum temperature July

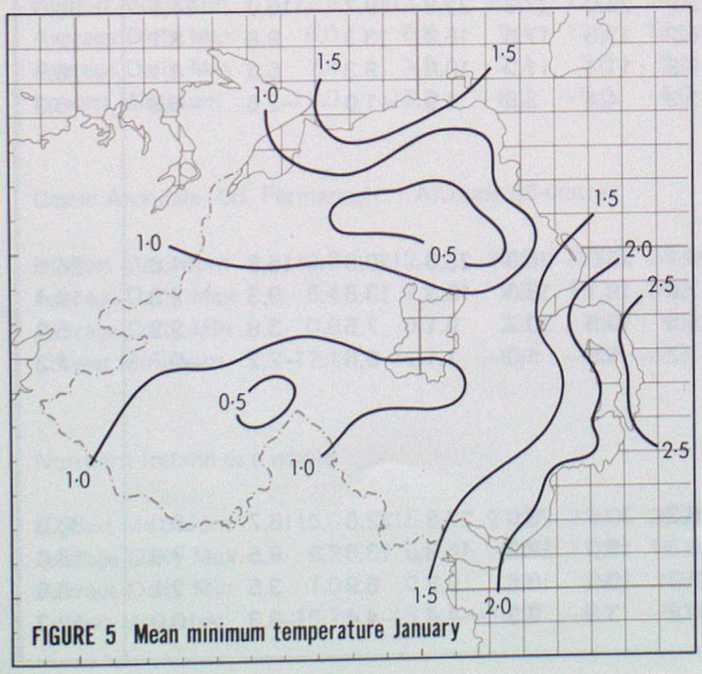


FIGURE 5 Mean minimum temperature January

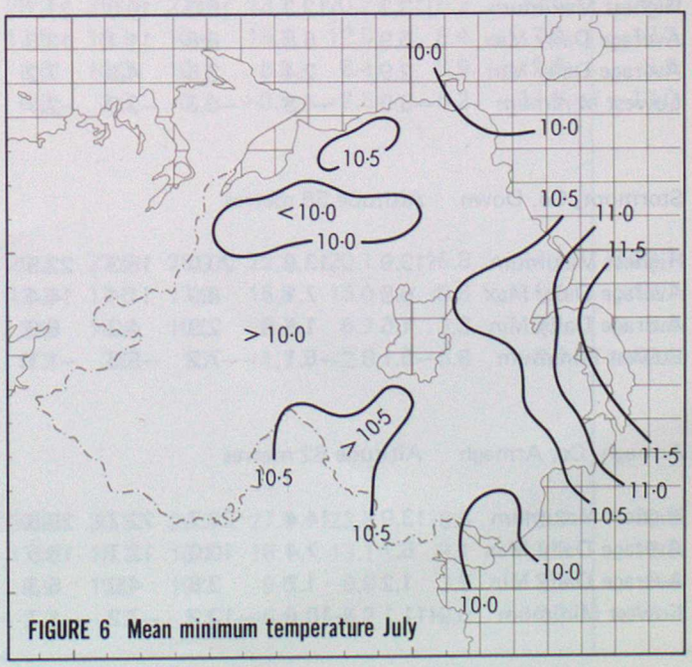


FIGURE 6 Mean minimum temperature July

Values of highest maximum temperature, average daily maximum, average daily minimum and lowest minimum for a selection of stations throughout Northern Ireland are given in Table 2. These illustrate the decrease in maximum temperatures with height (compare, for example, Aldergrove, 68 m, and Parkmore Forest, 235 m) but indicate little variation with height in the lowest minimum temperatures, which depend more on local topographical influences, i.e. the presence of 'hollows' and other sheltered places where cold air can collect. The lowest minimum recorded in Northern Ireland is −17.5 °C (see Appendix 3) and the highest maximum is 30.8 °C.

TABLE 2 Averages and extremes of temperature (°C) for a selection of stations in Northern Ireland, 1941–70

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Aldergrove, Co. Antrim Altitude 68 metres													
Highest Maximum	13.3	13.9	20.2	21.2	26.1	28.3	29.4	27.8	25.6	21.8	16.1	14.1	29.4
Average Daily Max	5.8	6.5	9.0	11.8	14.7	17.4	18.1	18.0	16.0	12.9	8.9	6.7	12.1
Average Daily Min	1.2	1.1	2.4	3.9	6.1	9.2	10.7	10.5	9.3	7.2	3.9	2.5	5.7
Lowest Minimum	−12.8	−11.7	−12.2	−5.1	−3.3	−1.2	2.2	1.1	−2.2	−5.0	−6.6	−10.7	−12.8
Parkmore Forest, Co. Antrim Altitude 235 metres													
Highest Maximum	12.2	11.7	18.3	19.6	21.7	25.5	23.9	24.4	23.3	20.6	13.7	12.4	25.5
Average Daily Max	5.5	5.2	6.9	9.7	12.6	15.6	15.8	16.5	14.5	11.8	7.6	6.1	10.7
Average Daily Min	0.1	0.2	1.1	2.5	4.7	7.5	8.4	8.6	7.5	6.2	2.5	1.1	4.2
Lowest Minimum	−8.9	−11.1	−10.0	−5.6	−3.9	0.0	1.7	1.7	−1.6	−1.8	−5.6	−10.6	−11.1
Hillsborough, Co. Down Altitude 116 metres													
Highest Maximum	12.8	13.3	19.4	20.7	24.4	27.2	27.8	27.0	24.4	22.2	16.1	13.9	27.8
Average Daily Max	6.1	6.4	8.6	11.3	14.0	16.8	17.7	17.6	15.7	12.7	8.9	7.2	11.9
Average Daily Min	1.2	1.1	2.1	3.8	5.9	8.8	10.3	10.2	9.1	7.0	3.6	2.2	5.4
Lowest Minimum	−10.0	−7.8	−10.0	−3.7	−3.3	0.0	3.9	2.8	−0.2	−2.8	−5.0	−8.3	−10.0
Kilkeel, Co. Down Altitude 18 metres													
Highest Maximum	13.3	13.3	16.0	19.0	21.7	22.8	25.0	23.3	22.8	19.7	16.0	14.1	25.0
Average Daily Max	6.9	6.8	8.6	11.1	13.5	16.2	17.3	17.6	15.9	13.3	9.8	8.1	12.1
Average Daily Min	2.9	2.4	3.5	4.9	7.2	9.8	11.1	11.2	10.0	8.3	5.3	4.1	6.7
Lowest Minimum	−5.0	−4.8	−6.3	−3.0	−2.7	3.3	4.4	3.5	1.9	−1.0	−2.6	−5.6	−6.3
Stormont, Co. Down Altitude 56 metres													
Highest Maximum	13.9	13.9	20.0	18.3	22.8	26.1	25.0	26.0	25.0	20.6	15.6	14.6	26.1
Average Daily Max	6.8	7.1	8.9	11.4	14.4	17.6	18.1	18.0	16.3	13.6	9.3	7.3	12.4
Average Daily Min	1.5	1.5	2.9	4.3	6.6	9.5	10.6	10.7	9.1	7.5	3.8	2.2	5.9
Lowest Minimum	−6.1	−6.1	−7.2	−5.6	−1.1	1.7	5.6	5.0	1.1	0.6	−2.2	−6.7	−7.2
Armagh, Co. Armagh Altitude 62 metres													
Highest Maximum	13.9	14.4	21.7	22.7	25.6	28.3	30.6	29.0	27.8	22.8	16.7	15.0	30.6
Average Daily Max	6.7	7.4	10.0	12.7	15.5	18.3	19.0	18.8	16.8	13.6	9.5	7.6	13.0
Average Daily Min	1.2	1.2	2.6	4.0	6.3	9.2	10.8	10.6	9.2	6.9	3.5	2.1	5.5
Lowest Minimum	−11.1	−10.6	−12.2	−7.2	−1.7	−0.6	3.9	2.2	−4.4	−4.4	−8.3	−10.0	−12.2

The humidity is a measure of the amount of moisture in the atmosphere. It can be expressed in absolute terms by, for example, the water vapour concentration (that is, the mass water vapour per unit volume of moist air). The relative humidity is the ratio of the actual vapour concentration to the maximum concentration of water which could be held by the air at the given temperature, and is expressed as a percentage. Another measure of the humidity is the dew-point, the temperature at which cooling air becomes saturated. Further cooling below this temperature leads to condensation, either as droplets suspended in the air or as dew on cold surfaces. The combination of high relative humidity and high temperatures produces uncomfortable 'close' conditions, whilst low humidities and moderate temperatures give the right environment for outdoor work. Changes in the relative humidity can be brought about by changes in air temperature as well as by changes of air-mass type, air of maritime origin being generally more humid than air of continental origin.

TABLE 2 (continued)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Ballykelly, Co. Londonderry Altitude 3 metres													
Highest Maximum	14.4	13.9	20.9	20.6	24.6	27.8	28.9	27.8	25.6	22.2	18.3	16.7	28.9
Average Daily Max	6.7	7.3	9.6	12.0	14.7	17.3	17.8	17.9	16.3	13.5	9.5	7.7	12.5
Average Daily Min	2.0	1.8	3.0	4.5	6.6	9.5	11.1	10.8	9.7	7.8	4.3	3.2	6.2
Lowest Minimum	−12.2	−12.8	−16.1	−5.0	−3.3	0.0	3.6	0.4	−2.2	−3.3	−6.7	−11.1	−16.1
Moneydig, Co. Londonderry Altitude 34 metres													
Highest Maximum	13.9	14.5	20.6	21.1	25.0	28.4	27.8	27.3	25.0	21.7	16.7	15.0	28.4
Average Daily Max	6.2	6.9	9.4	12.1	14.9	17.4	18.1	18.1	16.2	13.2	9.2	7.2	12.4
Average Daily Min	0.7	0.6	2.0	3.5	5.6	8.6	10.2	9.9	8.6	6.5	3.0	1.9	5.1
Lowest Minimum	−16.7	−15.5	−13.9	−6.7	−3.4	−1.2	2.2	0.1	−1.2	−4.3	−6.9	−10.0	−16.7
Carrigans, Co. Tyrone Altitude 113 metres													
Highest Maximum	12.5	12.5	20.0	22.0	24.2	28.2	28.0	27.6	23.1	20.7	15.3	13.6	28.2
Average Daily Max	6.0	6.8	9.4	11.9	14.8	17.5	18.1	18.4	15.8	12.5	8.4	7.0	12.2
Average Daily Min	1.4	1.3	2.7	3.8	5.6	8.6	10.3	10.1	8.8	6.4	3.9	2.9	5.5
Lowest Minimum	−13.0	−12.5	−8.3	−5.5	−4.0	0.0	2.8	0.7	−0.9	−2.5	−6.2	−11.5	−13.0
Castle Archdale, Co. Fermanagh Altitude 66 metres													
Highest Maximum	12.8	12.8	20.6	20.0	24.4	29.1	27.6	28.1	22.9	20.1	15.3	14.1	29.1
Average Daily Max	6.4	7.2	9.5	11.7	14.5	17.1	17.5	17.8	15.8	13.0	8.8	6.5	12.1
Average Daily Min	0.8	0.7	2.1	3.6	6.0	8.6	10.4	10.0	8.7	6.7	3.3	2.1	5.3
Lowest Minimum	−12.1	−11.1	−9.4	−7.0	−2.5	0.2	2.0	1.7	−1.1	−2.8	−5.8	−8.9	−12.1
Northern Ireland as a whole													
Highest Maximum	15.0	15.4	21.7	23.1	26.2	30.8	30.5	29.7	27.5	22.8	18.5	18.8	30.8
Average Daily Max	6.2	6.9	9.3	11.9	14.3	17.4	18.1	18.1	16.1	13.1	9.1	7.0	12.3
Average Daily Min	1.0	0.9	2.2	3.8	6.0	8.9	10.5	10.2	9.0	6.9	3.5	2.2	5.4
Lowest Minimum	−16.7	−15.5	−13.9	−8.2	−6.1	−2.2	−1.1	−1.1	−5.6	−6.7	−10.0	−12.2	−16.7

The higher the temperature the more water vapour the air is capable of holding so the relative humidity has a characteristic daily cycle, with a maximum in the early morning and a minimum in the afternoon, which is directly opposite to the typical diurnal temperature variation. This is clearly demonstrated in Table 3 which gives the relative humidities at Ballykelly and Aldergrove at 03, 09, 15 and 21 GMT, on a monthly basis. The main departures from this general rule occur during misty or foggy weather, when rain is falling or when a change of air mass occurs during the day.

Variations from place to place in the British Isles are most in evidence in the afternoon, at the time of minimum relative humidity. The value of the minimum relative humidity is largely controlled by the temperature, but distance from the coast is important, partly by affecting the maximum temperature and partly by determining the amount of available moisture.

In the six months October to March, minimum values of relative humidity show only small variations throughout the British Isles, averaging 75 per cent to 85 per cent. In midsummer the afternoon relative humidities in central and southern England are rather lower than in Northern Ireland, but the difference is not great, being 60–65 per cent as against 70–75 per cent.

High humidities (up to 100 per cent, which corresponds to saturation) can occur at times on hills which may be enveloped in low cloud, on cold nights when mist and fog may form in sheltered places, and also in precipitation.

TABLE 3 Averages of relative humidity (per cent) for Northern Ireland, 1961–70

Ballykelly
National Grid Reference 24/624234 Altitude 2 metres

Time (GMT)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
03	87	85	86	86	87	88	91	90	88	87	87	86	87
09	87	86	83	79	77	77	80	82	85	86	86	86	83
15	82	77	73	69	69	70	73	72	75	78	81	83	75
21	86	84	84	83	82	81	86	85	87	86	86	85	85

Belfast/Aldergrove Airport
National Grid Reference 33/147798 Altitude 68 metres

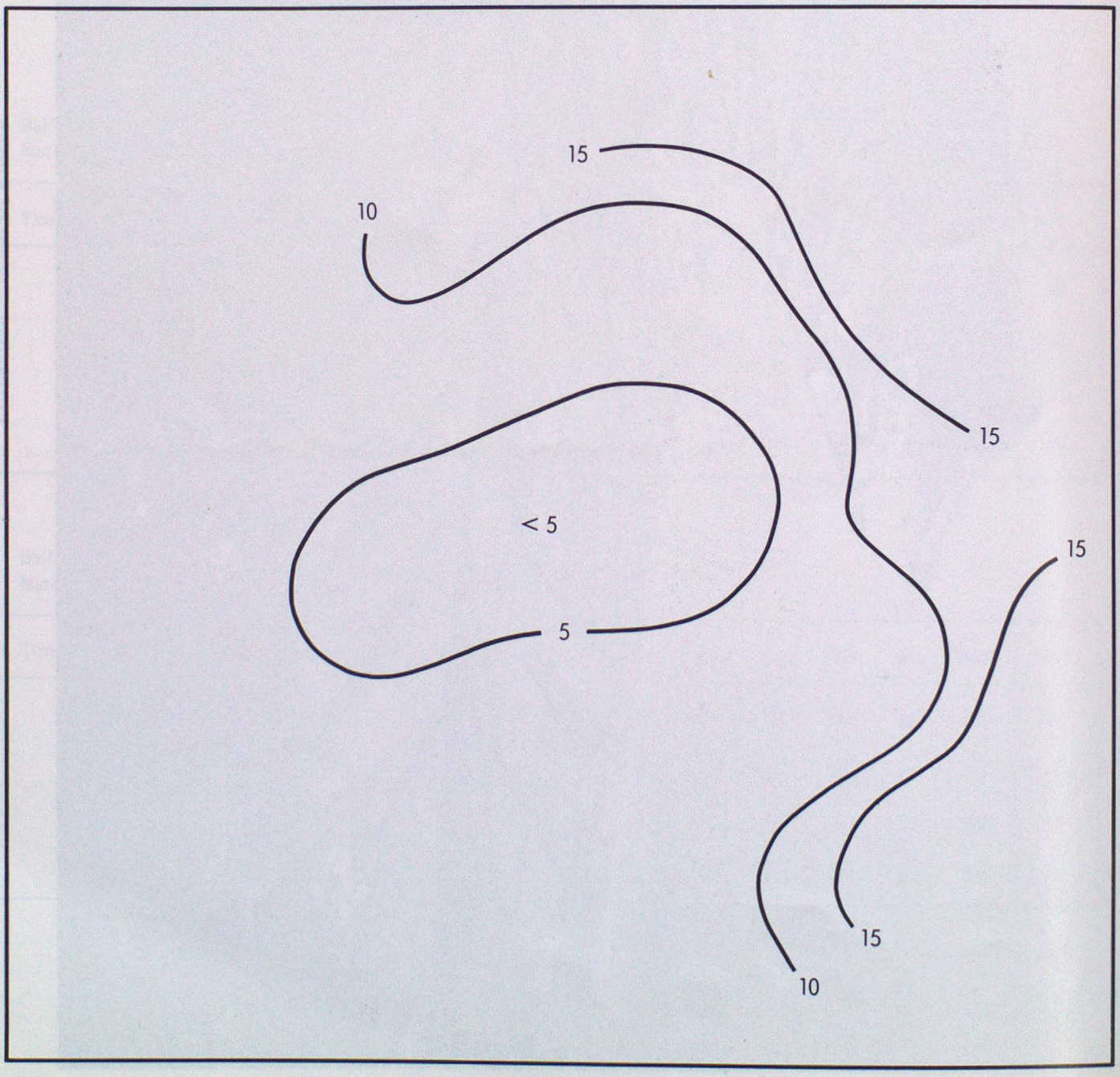
Time (GMT)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
03	90	87	88	89	89	89	89	91	91	91	89	89	89
09	90	88	87	82	80	78	82	85	87	89	89	89	85
15	85	79	74	69	70	69	71	74	76	80	82	85	76
21	89	86	85	84	83	81	83	86	88	89	88	88	86

Lurigethan — Glens of Antrim.

WIND

The windiest areas are the coastal fringes of counties Antrim and Down. This is because wind speeds over the sea are usually higher than over adjacent land areas, simply because the sea is smoother than the land and the effect of friction is correspondingly less. Topographical effects near or over land can also be very important and, in the vicinity of hills, localities can be found where wind speeds may be much higher than the general average for the area. Figure 7 shows the distribution of the annual average number of days with gales and illustrates the relatively protected central area with less than 5 occurrences each year. (A day with gale is defined as one on which the mean wind speed at the standard measuring height of 10 m above ground attains a value of 34 knots, that is 39 miles per hour or 17.2 metres per second, or more, over any period of 10 minutes during the 24 hours.) Around the coastal fringe the number of days with gales exceeds 15. Table 4 illustrates the monthly variation in these figures and indicates that November, December and January are the windiest months whilst July and August are the least windy. Since the prevailing wind direction in Northern Ireland is between south and west the whole area is protected by the Republic of Ireland, so even the coastal areas are much less windy than exposed areas in Scotland and England. For example, Shetland and the Hebrides experience, on average, about 43 and 35 days, respectively, with gales each year and the extreme south-west of England experiences about 30. However, the protected inland areas of Northern Ireland experience more gales than similar areas in southern England.

FIGURE 7 Mean annual number of days with gales



Extreme wind speeds are important since they may cause widespread damage. Tables 5(a) to (d) give the maximum winds (with directions) at a selection of localities in Northern Ireland. Unlike the frequency of occurrences of days with gales the maximum hourly wind speeds and gusts are fairly evenly distributed throughout the year. There is also little variation in the value of the maximum hourly wind speed from place to place.

Although the most common wind direction is south-westerly, in fact the wind only blows from between south and west for about one-third of the time and for only about half of the time does it have a westerly component. Calm or light winds occur about one-tenth of the time and winds with an easterly component blow for the remainder of the time. As well as influencing wind speed, topography can have a marked local effect on wind direction with, for example, the wind direction tending to be aligned along well-defined valleys. Over most of Northern Ireland the average wind speed is in the range 8–10 knots, which is similar to that experienced in other parts of the British Isles.

TABLE 4 Monthly and annual average number of days with gales, 1941–70

	Altitude (metres)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Co. Antrim														
Aldergrove	68	0.9	0.3	0.2	0.1	0.1	0.1	0.0	0.1	0.3	0.3	0.4	0.6	3.4
Belfast	32	1.8	0.7	1.6	0.4	0.3	0.3	0.0	0.2	0.6	0.7	1.8	1.6	10.0
Ballycastle	152	2.1	1.6	1.9	0.5	0.5	0.3	0.1	0.1	0.9	2.4	3.2	5.2	18.8
Co. Down														
Bangor	15	2.2	1.7	2.2	0.5	0.8	0.0	0.0	0.3	0.8	0.5	1.7	1.1	11.8
Kilkeel	18	3.8	1.9	1.9	0.9	0.4	0.2	0.2	0.5	1.0	1.3	2.8	2.7	17.6
Hillsborough	116	0.8	0.6	0.2	0.5	0.1	0.1	0.0	0.2	0.5	0.5	0.5	1.0	5.0
Co. Armagh														
Armagh	62	1.0	0.9	0.4	0.6	0.1	0.2	0.1	0.2	0.7	0.7	1.0	1.4	7.3
Co. Derry														
Ballykelly	2	2.1	2.6	1.1	1.1	0.5	0.3	0.1	0.3	0.7	0.5	1.0	2.0	10.0
Coleraine	23	0.6	1.4	0.2	0.2	0.0	0.0	0.0	0.0	0.4	0.6	0.8	0.6	4.8
Co. Tyrone														
Carrigans	113	0.9	0.6	0.8	0.6	0.3	0.0	0.0	0.0	0.2	0.4	0.3	0.2	4.3
Co. Fermanagh														
Castle Archdale	66	0.8	0.5	0.3	0.5	0.1	0.0	0.0	0.1	0.5	0.3	0.9	1.1	5.0

TABLE 5a Extreme wind speeds and directions at specified locations in Northern Ireland

Belfast (Aldergrove) Airport 1927–1981

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	43	45	34	35	36	45	30	36	49	42	47	44	49
Wind Directions	240	180	220 270	170	300	230	160	160	190	230	150	220	190
Year of Occurrence	1954	1957	1963	1963	1954	1960	1964	1959	1961	1961	1959	1966	1959
Highest Gust Speed in Knots	69	71	56	57	61	65	47	56	76	68	73	69	76
Wind Directions	240	190	230	170	160	230	160	310	200	230	240	330	200
Year of Occurrence	1954	1957	1963	1963	1934	1960	1964	1957	1961	1961	1928	1966	1961

TABLE 5b Extreme wind speeds and directions at specified locations in Northern Ireland

Carrigans (near Omagh) 1964–1981

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	45	32	38	33	30	29	26	26	30	34	43	39	45
Wind Directions	290	190	270	320	260	320	210	250	180	250	260	330	290
Year of Occurrence	1965	1966	1966	1965	1965	1975	1964	1966	1964	1970	1965	1966	1965
Highest Gust Speed in Knots	76	62	64	57	56	49	44	46	50	64	81	72	81
Wind Directions	280 200	190	270	300	260	320	210	220 250	190	240	260	350	260
Year of Occurrence	1965 1974	1966	1966	1973	1965	1975	1964	1965 1966	1964	1970	1965	1966	1965

TABLE 5c Extreme wind speeds and directions at specified locations in Northern Ireland

Castle Archdale Forest 1964–1981

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	48	36	38	29	31	24	27	29	34	30	43	36	48
Wind Directions	180	170	240	120	250	170	210	180	200	210	220	170	180
Year of Occurrence	1974	1966	1966	1966	1966	1965	1964	1965	1964	1972	1965	1966	1974
Highest Gust Speed in Knots	87	57	68	52	53	45	45	46	56	54	71	68	87
Wind Directions	180	170	240	290	250	170	210	180	200	230	230	300	180
Year of Occurrence	1974	1966	1966	1969	1966	1965	1964	1965	1964	1970	1965	1966	1974

TABLE 5d Extreme wind speeds and directions at specified locations in Northern Ireland

Belfast Harbour 1964–1981

Wind directions are in degrees true and wind speeds in knots.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Highest Mean Hourly Wind Speed	46	39	43	42	45	36	31	38	37	36	40	47	47
Wind Directions	300	260	260	050	290	340	310	280	160	050 160	280	330	330
Year of Occurrence	1976	1973	1967	1973	1966	1975	1968	1970	1973	1968 1972	1975	1966	1966
Highest Gust Speed in Knots	80	60	61	62	66	57	49	50	61	60	65	70	80
Wind Directions	300	280	260	290	280	290	290	280	160	270	280	330	300
Year of Occurrence	1976	1967	1967	1973	1966	1975	1968	1970	1973	1970	1973	1966	1976

Mountains of Mourne.

SUNSHINE

Northern Ireland as a whole has, on average, about 1300 hours of bright sunshine each year, compared to favoured places in southern England (around 1700 hours) and Majorca (2800 hours). The sunniest area is the County Down coast where, in some years, over 1500 hours of sunshine have been recorded. Table 6 gives values for the mean daily sunshine (on a monthly basis) for a selection of stations. The sunniest month is generally May with over 6 hours a day whilst the dullest month is December with just over 1 hour a day. A significant decrease in sunshine occurs in July, corresponding to the marked increase in rainfall and associated cloudiness in this month. It is worth noting that although the coastal areas are cooler in summer than places further inland they do tend to get more bright sunshine; this is the result of sea-breezes which, while bringing cooler air off the sea, do at the same time often disperse cloud near the coast.

TABLE 6 Averages of sunshine for Northern Ireland, 1941–70

Values in mean hours per day

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Aldergrove	1.43	2.40	3.30	5.12	6.17	5.82	4.41	4.42	3.47	2.53	1.87	1.12	3.51
Armagh	1.52	2.43	3.37	4.89	5.91	5.50	4.12	4.30	3.52	2.66	1.94	1.18	3.45
Ballykelly	1.59	2.68	3.51	5.30	6.34	5.69	4.34	4.68	3.71	2.82	1.98	1.21	3.65
Bangor	1.59	2.27	3.05	5.20	6.40	6.20	4.50	4.81	3.57	2.87	1.70	1.18	3.61
Bessbrook	1.68	2.62	3.34	5.01	6.11	5.99	4.65	4.67	3.59	2.75	2.04	1.32	3.65
Castle Archdale	1.62	2.55	3.24	4.91	6.03	5.39	4.30	4.51	3.57	2.63	2.07	1.36	3.51
Hillsborough	1.51	2.38	3.20	4.83	5.95	5.89	4.38	4.37	3.50	2.65	1.93	1.22	3.48
Kilkeel	1.81	2.59	3.30	5.37	6.51	6.52	4.95	4.93	3.78	3.02	1.96	1.35	3.84
Lough Bradan	1.43	2.29	3.24	4.70	5.62	5.17	3.94	4.22	3.48	2.48	1.99	1.25	3.32
Portrush	1.52	2.56	3.33	5.30	6.70	5.97	4.57	4.94	3.85	2.85	1.95	1.12	3.72
Stormont Castle	1.62	2.44	3.39	5.02	6.45	6.21	4.68	4.64	3.58	2.72	2.07	1.36	3.68

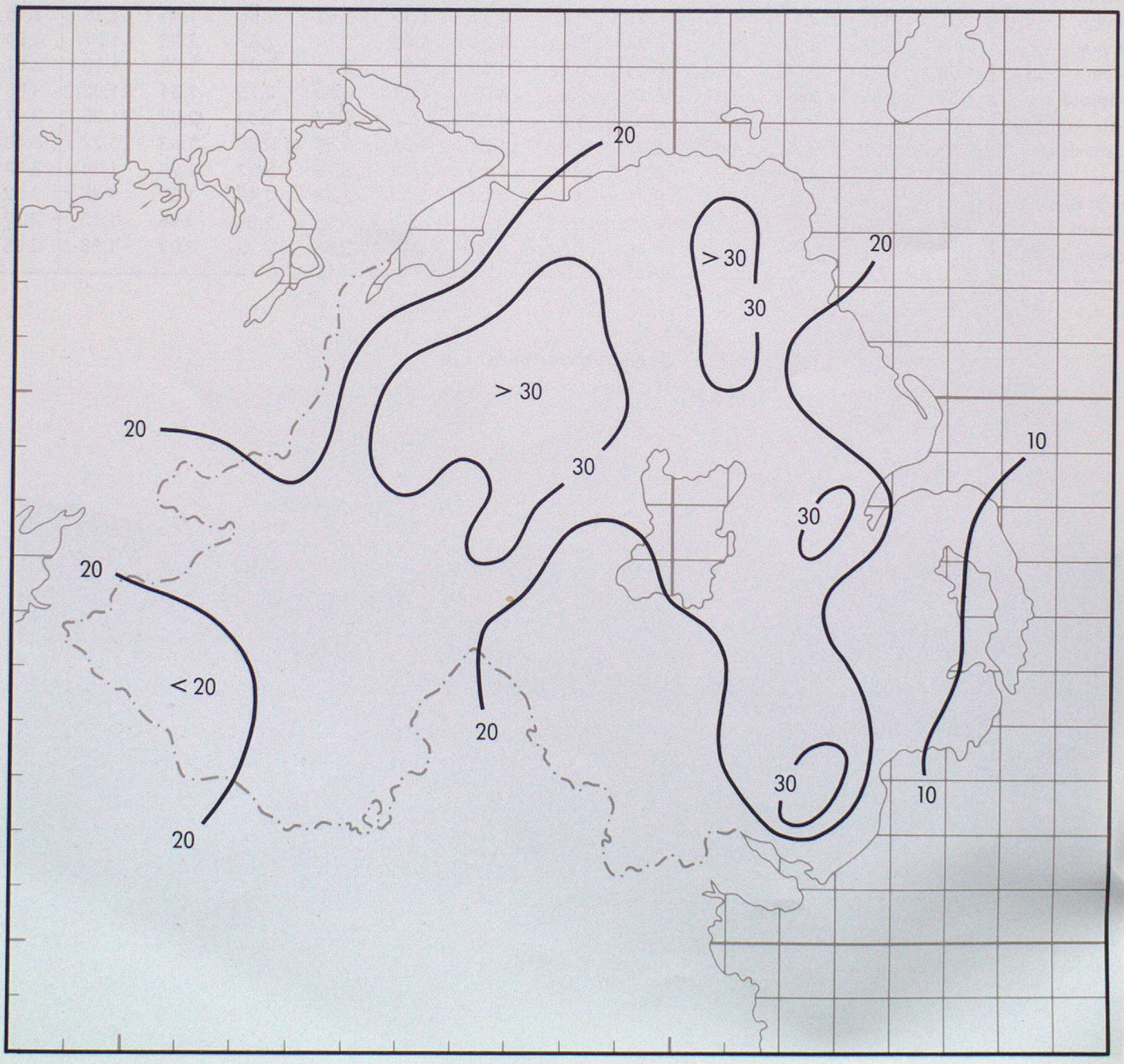
Sperrin mountains.

SLEET AND SNOW

Snowfall is one of the most variable of meteorological elements both in amount and duration. There can be winters when little or no snow falls on low ground and others such as 1962–63 and 1981–82 when snow lay for a considerable period. In most years snowfall is not a great problem in Northern Ireland but, on occasions, heavy falls accompanied by drifting in strong winds can hamper transport for a short time. Height above sea level is an important factor governing whether precipitation will be in the form of rain, sleet or snow and can also strongly influence the persistence of snow cover. Similarly, distance from the coast is relevant so that the average annual number of days with snow or sleet falling is a maximum over high ground inland (Figure 8). The maximum number of days with snow falling (a little over 30) is much less than that which occurs in the Highlands of Scotland where snow falls on about 70 days each year. It is unusual for snow to fall outside the period November to May and the highest frequencies of occurrence are in January and February.

A day with snow lying is defined as one when more than half of the ground is covered by snow at 09 GMT. For Northern Ireland the average annual number of days with snow lying for the period 1941–70 varies from more than 30 days on the high ground inland to less than 10 around the coastal fringe. This compares with more than 60 days in central Scotland and the high ground of northern England. Of course, in mountainous areas, snow beds (local hollows filled by drifting snow) may survive for a considerable period which bears no relation to the number of days with snow lying in the immediate vicinity or even to exposed areas at much higher levels.

FIGURE 8 **Mean number of days each year with sleet or snow falling, for the period 1941–70**



Slemish mountain in winter.

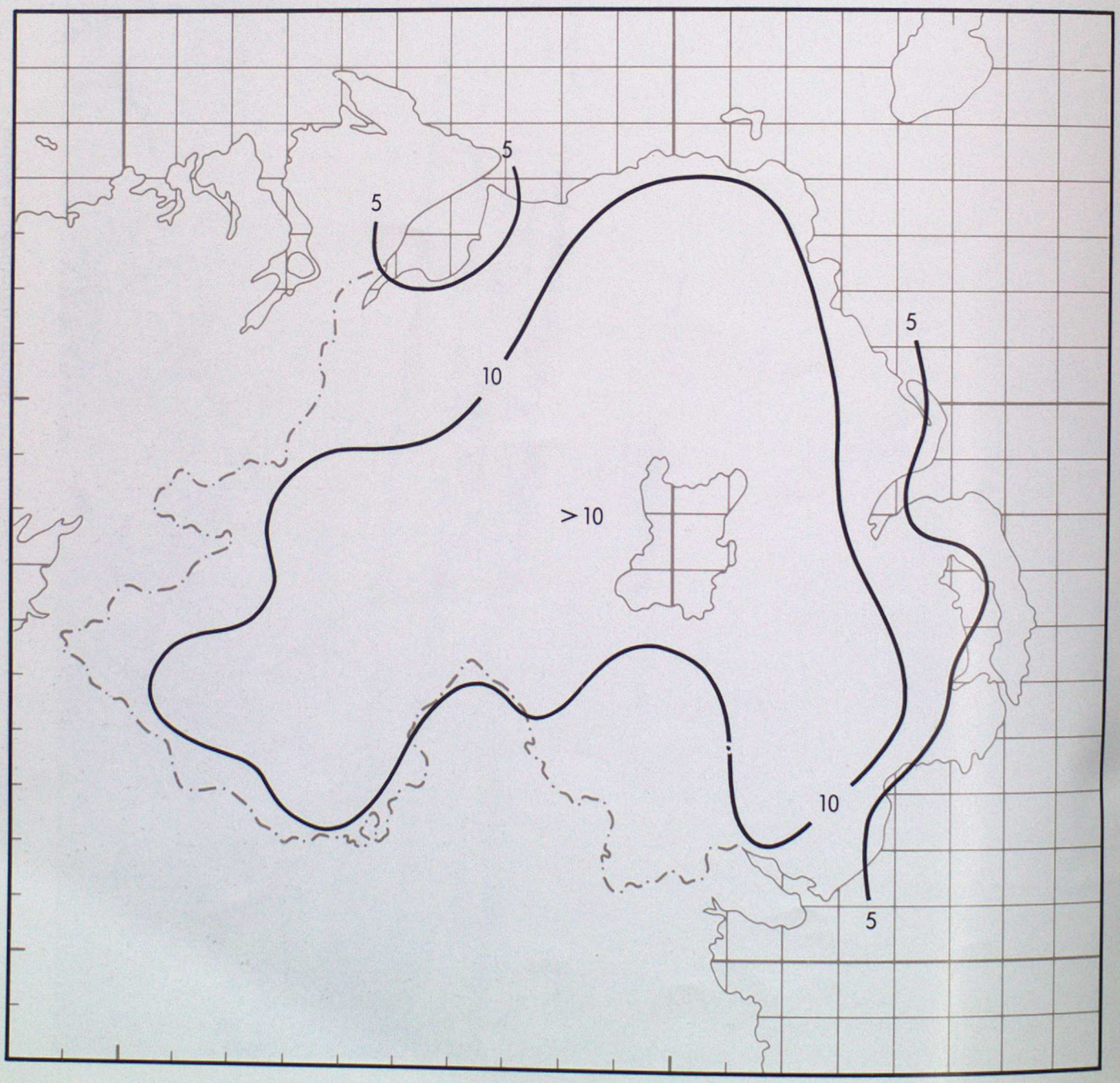
VISIBILITY

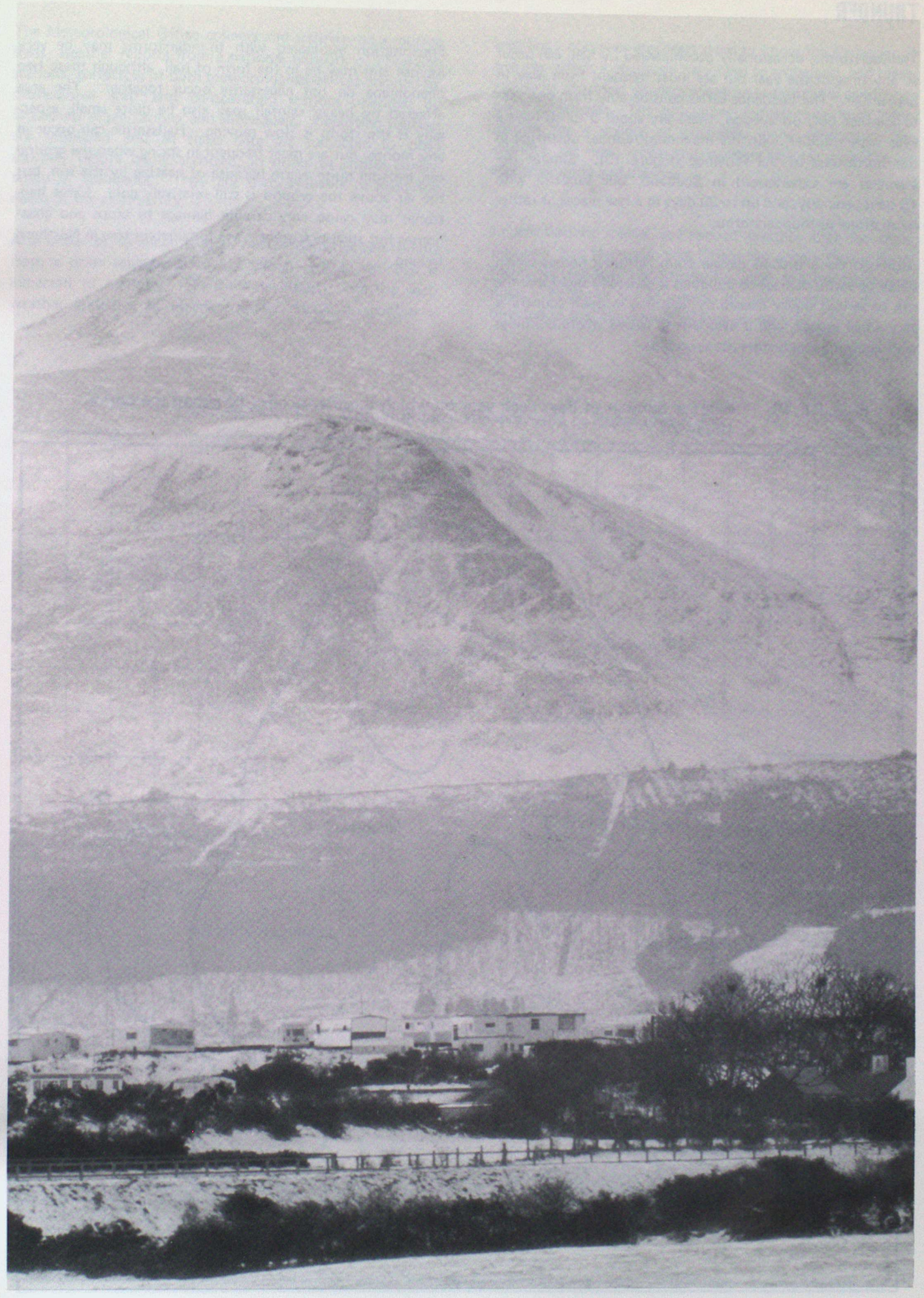
Northern Ireland enjoys generally good visibility compared to the industrialized areas of central England and the Forth-Clyde valley of Scotland. The visibility can range from a few tens of metres in fog to upwards of 50 km on very clear days. This section is mainly concerned with the occurrence of visibilities of less than 200 metres, roughly the limit below which disruption can be caused to road traffic.

Fog is formed when air is cooled below its dew-point and water droplets remain suspended in the atmosphere in sufficient concentrations to cause marked reductions in the visibility. This cooling can occur when air is forced to rise over hills, thereby forming cloud which can be at ground level (hill fog), or by contact with the cooling land surface on clear nights (radiation fog). Cooling can also be caused by the passage of warm moist air over a relatively cold sea surface (advection fog). This creates sea fog which is particularly prevalent in the spring. Near industrial areas the visibility can also be reduced by solid particles of pollution suspended in the air producing smoke haze. Reduction of visibility by smoke haze sometimes occurs in the Belfast area and Northern Ireland is occasionally affected by the transport of pollution from the industrial areas of England in a prolonged spell with south-easterly winds.

Figure 9 gives the distribution of the average number of days each year with fog throughout Northern Ireland. The highest values occur in central areas with frequencies in the range 10–15 days each year. Coastal areas of counties Down and Antrim have less than 5. The figures compare favourably with those from other parts of the British Isles.

FIGURE 9 Annual average number of days with fog 1941–70





Slieve Donard (840 m), the highest mountain in Northern Ireland, in winter.

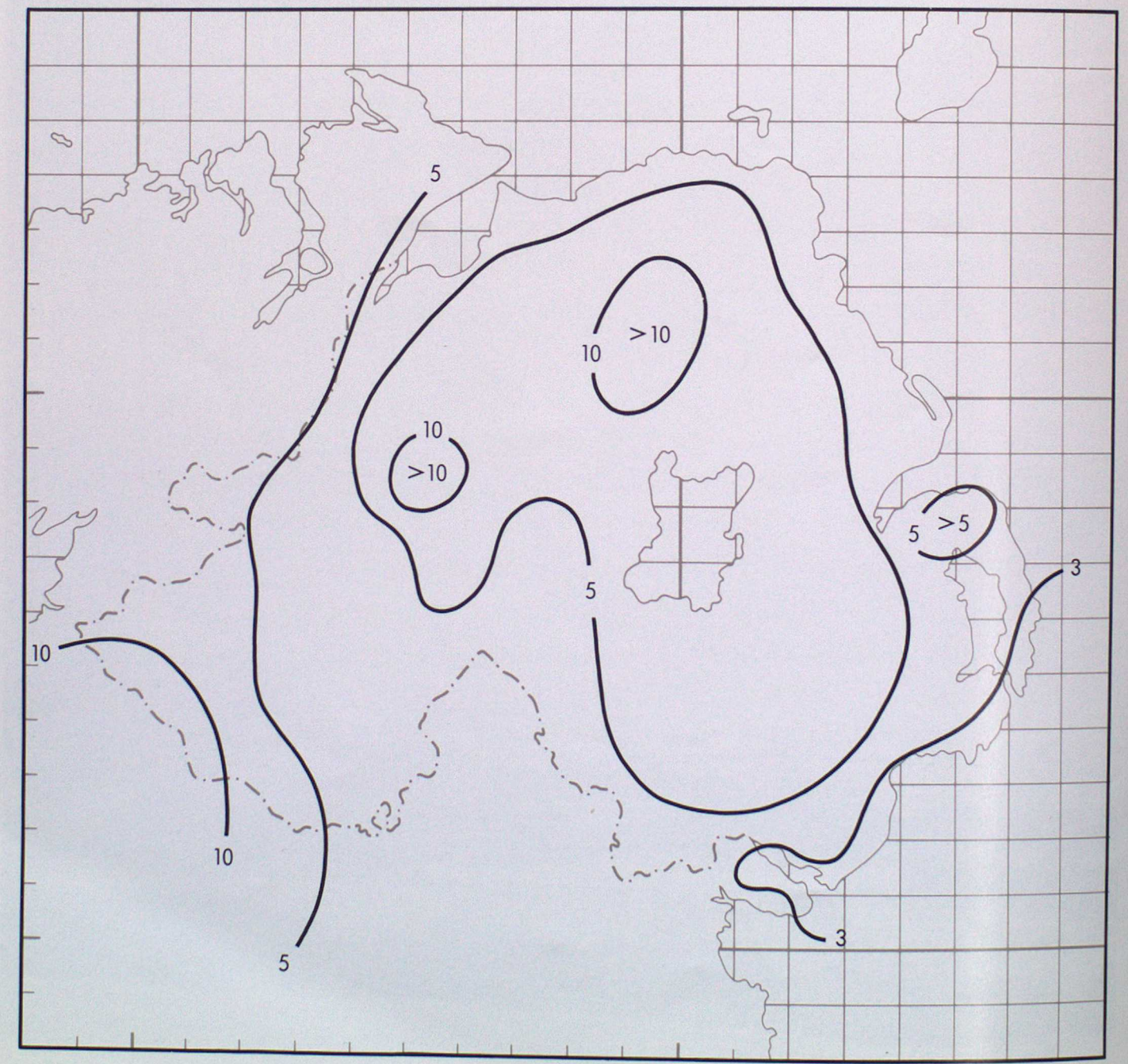
THUNDER

Thunderstorms, occasionally accompanied by hail, can occur at any time of the year but are most frequent from May to September. The incidence varies considerably from one year to another but, on average, there are about 5 to 10 days a year with thunder, with the maximum number occurring in the north-west of the Province (Figure 10). Similar frequencies are experienced in Scotland, but England with 15 days generally, and up to 20 days in a few places, is rather more prone to thunderstorms.

Although there is some danger from lightning flashes which strike to earth, damage to buildings is generally slight and the risk of serious injury caused by lightning in open country is very small indeed, and is even less in towns where buildings with lightning conductors act as screens.

Precipitation associated with thunderstorms may be very intense and may be in the form of hail, although these two phenomena do not necessarily occur together. The area affected by heavy rainfall may also be quite small, especially if the storm is slow moving. Hailstorms can occur in any month, but are most frequent in spring when the ground can become quite warm because of heating by the sun, but the air above the ground is still relatively cold. Large hailstones may cause considerable damage to crops and glasshouses but such occurrences are fortunately rare in Northern Ireland.

FIGURE 10 **Average number of days each year on which thunder occurs, based on the period 1941–70**



FURTHER INFORMATION

The Meteorological Office collects and archives, on a routine basis, weather reports from a national network of observing stations, consisting of both meteorological offices manned by professional staff and co-operating stations operated by interested organizations and individuals. Reporting stations are inspected and all these data are subjected to close scrutiny before being archived, in order to ensure consistency of standards. They are then available to meet the needs of the community.

Any undertaking which is at all weather-sensitive can benefit from a prior knowledge of the climate within which it is expected to operate. The building industry can use past-weather statistics to estimate likely delays on contracts, architects and civil engineers need to know the extremes of weather which a structure may have to withstand, and many industrial processes are dependent on atmospheric conditions for their success. The agricultural industry uses such information for a variety of purposes, many relating to the viability of new crops and weather-related incidence or spread of pests and diseases.

In addition to special analyses of weather data for these purposes, the Meteorological Office can supply factual statements on weather conditions for legal and insurance purposes. Enquiries on all aspects of past weather should be directed to the appropriate address on page 4

APPENDIX 1 Climatological stations used in this publication

APPENDIX 2 Climatological data for a selection of places in England, Wales and Scotland (averages over the 30–year period 1941–70)

	Altitude	Average annual rainfall	Average daily maximum temperature		Average annual duration of bright sunshine
			Jan	Jul	
	m	mm	°C		h
Aberystwyth (Dyfed)	136	1049	6.7	17.7	1474
Ambleside (Cumbria)	46	1902	5.8	19.2	1179
Blackpool (Lancashire)	10	862	5.8	18.8	1551
Bournemouth (Dorset)	40	839	7.1	20.7	1747
Cardiff (South Glamorgan)	62	1085	6.8	20.4	1525
Clacton-on-Sea (Essex)	16	573	5.5	20.4	1656
Colwyn Bay (Clwyd)	36	751	7.5	18.7	1525
Douglas (Isle of Man)	87	866	6.7	17.2	1575
Durham (Durham)	102	650	5.4	19.3	1332
Folkstone (Kent)	39	720	6.3	20.2	1749
Ilfracombe (Devon)	8	1047	8.2	18.6	1631
London – Kew (Greater London)	6	599	6.1	21.6	1529
Lowestoft (Suffolk)	25	602	5.7	20.1	1594
Manchester Airport (Greater Manchester)	75	819	5.5	19.6	1334
Oxford (Oxfordshire)	63	659	6.2	21.5	1517
Penzance (Cornwall)	19	1098	9.4	19.5	1720
Shrewsbury (Salop)	56	627	6.2	20.5	1361
Skegness (Lincolnshire)	5	596	5.6	19.6	1523
Southampton (Hampshire)	3	801	7.4	21.8	1633
Weston-super-Mare (Avon)	9	806	7.1	20.6	1578
Glasgow Airport (Strathclyde)	5	982	5.5	18.6	1266
Edinburgh (Lothian)	26	661	5.9	18.6	1332
Braemar (Grampian)	339	879	3.5	17.1	1120
Wick (Highland)	36	788	5.1	15.4	1264
Lerwick (Shetland)	82	1172	4.7	14.0	1067
Stornoway (Western Isles)	3	1094	6.5	15.5	1244

APPENDIX 3 Weather extremes in Northern Ireland

Rainfall

Maximum fall in a day (09–09 GMT):

158.7 mm (6.25 inches) at Tollymore Forest, Co. Down on 31 October 1960.

Maximum fall in less than 1 hour:

97.0 mm in 45 minutes at Orra Beg, North Antrim, 1 August 1980 (Record for UK).

Bright Sunshine

Maximum duration in one month:

295.3 hours at Aldergrove, Co. Antrim, May 1946.

Minimum duration in one month:

12.2 hours at Castle Archdale, Co. Fermanagh, in December 1977.

Air Temperature

(Measured under standard conditions at 1.25 m above ground)

Highest recorded:

30.8 °C at Knockarevan near Belleek, Co. Fermanagh, 30 June 1976.

Lowest recorded:

–17.5 °C at Magherally, near Banbridge, Co. Down, 1 January 1979.

Wind Speed

(Measured under standard conditions at 10 m above ground)

Highest mean hourly wind:

56 kn at Orlock Head, Co. Down. 29 January 1978.

Highest Gust recorded:

108 kn at Kilkeel, Co. Down, 12 January 1974.

APPENDIX 4 Conversion Tables

RAINFALL 1 inch = 25.4 mm

Millimetres	Inches	Millimetres	Inches	Millimetres	Inches	Millimetres	Inches
0	0	30	1.2	200	7.9	800	31.5
5	0.2	35	1.4	300	11.8	900	35.4
10	0.4	40	1.6	400	15.7	1000	39.4
15	0.6	45	1.8	500	19.7	1500	59.1
20	0.8	50	2.0	600	23.6	2000	78.7
25	1.0	100	3.9	700	27.6	4000	157.5

TEMPERATURE degrees Celsius (centigrade) to degrees Fahrenheit °F = (°C x 9/5) + 32

°C	°F	°C	°F	°C	°F	°C	°F
–18	0	–2	28	14	57	30	86
–16	3	0	32	16	61	32	90
–14	7	2	36	18	64	34	93
–12	10	4	39	20	68	36	97
–10	14	6	43	22	72	38	100
–8	18	8	46	24	75	40	104
–6	21	10	50	26	79	42	107
–4	25	12	54	28	82	44	111

APPENDIX 5 Location of Belfast Climate Office